

REMARKS/ARGUMENTS

This amendment is filed in response to the Office Action dated May 24, 2004. Claims 49-52 have been added. Support for these claims can be found in Fig. 4, the corresponding text, and elsewhere in the original application.

If after consideration of this written amendment, the Examiner does not believe the Application is in condition for allowance, Applicants hereby request a telephone interview prior to the issuance of a new Office Action. The Examiner is invited to contact Applicant's undersigned representative by telephone (732) 542-9070 to schedule a telephone interview if the application is not deemed to be in condition for allowance for some reason.

In the Office Action, the Examiner indicated that claims 7-16, 23-32 and 39-48 were directed to allowable subject matter. Applicants thank the Examiner for this indication of allowable subject matter. Claims 7, 11, 23, 27, 39 and 43 have been rewritten in independent form. Accordingly, claims 7-16, 23-32 and 39-48 no longer depend from a rejected base claim and are now in condition for allowance.

In the Office Action the Examiner rejected claims 1, 3-6, 17, 19-22, 33, and 35-38 as being unpatentable over U.S. Patent No. 5,867,478 to Baum et al. in view of U.S. Patent No. 6,131,016 to Greenstein et al. In addition, the Examiner rejected claims 2, 18, and 34 as being obvious over the Baum et al. patent in view of the

Greenstein et al. patent further in view of U.S. Patent No. 6,018,317 to Dogan et al. Accordingly, claims 1-6, 17-18, 19-22, and 33-38 stand rejected. In each of these rejections, the Baum et al. patent is used as the principal reference with Greenstein et al. being used as a secondary reference in each of the rejections.

As will be discussed below, as amended, none of the pending claims are anticipated or rendered obvious by the prior art of record.

II. Claims 7-16, 23-32 and 39-48 Are Allowable

As discussed above, Claims 7, 11, 23, 27, 39 and 43 have been rewritten in independent form. Accordingly, claims 7-16, 23-32 and 39-48 which were indicated to be directed to allowable subject matter no longer depend from a rejected base claim and are now in condition for allowance.

**III. Claims 1-6, 17-18, 19-22, 33-38
And New Claims 49-52 Are Allowable**

Independent claims 1, 17 and 33 have been amended. As amended, each of these claims clearly distinguishes over the applied references.

The applied references, alone or in combination, do not disclose, teach, or suggest the novel pilot tone hopping sequences, the use of different slopes by adjacent base stations, or the novel energy based pilot tone hopping sequence detection methods recited in

various claims. In accordance with the invention, in various claims, energy is accumulated for different pilot sequences which have different pilot tone slopes over multiple symbol time periods. This allows the pilot tone hopping sequence with the most accumulated energy to be detected.

Accordingly, as amended, all of the pending claims are patentable over the applied references.

Set forth below is a brief discussion of the present invention and the prior art explaining why the claims, as amended are patentable over the applied references.

A. The Present Invention

In accordance with various exemplary embodiments of the present invention novel pilot tone hopping sequences are used by base stations, e.g., adjacent base stations, to facilitate detection of pilot tone hopping sequences and differentiation between pilot tone hopping sequences used by different base stations. The pilot tone hopping sequences of the present invention convey base station identification information through the use of different frequency shifts which are used to change the pilot tones transmitted from one symbol time period to the next. The use of different frequency shifts for different pilot tone hopping sequences results in different pilot tone hopping sequences having different slopes when the tones of a sequence are plotted relative to time. The different pilot tone hopping sequence slopes are used to differentiate between different, potentially adjacent, base stations in accordance with the invention and to

facilitate energy accumulation for different possible pilot tone sequences which may be received.

A receiver apparatus, e.g., a mobile device, implemented in accordance with the present invention, in various exemplary embodiments, uses energy detection techniques to detect received pilot tones corresponding to one or more different pilot tone hopping sequences and to identify the received pilot tone hopping sequence having the most energy over a period of multiple symbol time periods. In various embodiments, an energy accumulator is used to generate an accumulated energy measurement for each of the plurality of tone hopping sequences which may be received. A detector then determines which pilot tone hopping sequence has the most accumulated energy over a period of multiple symbol time periods. In various embodiments, such as the one illustrated in Fig. 4, by including multiple pilot tones corresponding to a pilot tone hopping sequence during each symbol time period and including pilot tones in each successive symbol time period, rapid energy based detection of received pilot tone hopping sequences is facilitated since the amount of time required to accumulate energy is reduced as compared to embodiments which use a single pilot tone per symbol time period or do not transmit pilot tones on a consecutive basis. In addition, in embodiments where the multiple tones corresponding to a pilot sequence are separated in terms of frequency by one or more tones within a symbol transmission period, the risk of interference centered around one frequency significantly affecting the accumulated energy for a given pilot tone hopping

sequence is reduced since the tones are separated from one another in terms of frequency within an individual symbol time period.

The applied references do not teach, disclose or suggest the novel pilot tone hopping sequences of the present invention which involve using different slopes for pilot tones in adjacent base stations. The applied references also fail to teach, disclose or suggest, the energy accumulation and pilot tone hopping sequence detection methods of the invention which involve accumulating energy for multiple pilot tone hopping sequences which may be received over multiple symbol time periods and detecting a received pilot tone hopping sequences based on which sequence has the most accumulated energy over a period which includes multiple symbol time periods.

**B. The Applied References Do Not Render
Obvious the Pending Claims**

The Baum patent describes a system in which various pilot tone sequences are used. Notably however, **the Baum patent does not disclose the use of different pilot tone slopes by different adjacent base stations.** It also fails to teach, disclose or suggest a plurality of pilot tone sequences of the type recited in independent claims 1, 17, 33 and new claims 50 and 51, In addition, **it fails to disclose the accumulation of energy corresponding to pilot tone sequences which have different pilot tone slopes over multiple symbol time periods.** The other references applied by the Examiner do

not make up for the deficiencies of the Baum patent. Accordingly, independent claims 1, 17, 33 and new claims 50-51, as well as the claims which depend there from are patentable over the Baum patent whether considered alone or in combination with the other references.

The Greenstein patent relied upon by the Examiner as teaching comparing the strengths of successive received pilot tones does not deal with pilot hopping sequences transmitted by **different** base stations and does not disclose a plurality of pilot hopping sequences of the type recited in independent claims 1, 17, 33 and new claims 50 and 51 where different adjacent base stations use pilot tone hopping sequences having different pilot tone slopes. Relatively little information is provided in the Greenstein patent in regard to how the power of the pilot tone signals is determined.

The Greenstein patent describes a system where receiver diversity is allegedly achieved through the use of transmit diversity at a base station which uses multiple antennas and feed back information supplied to the base station. In the Greenstein patent pilot tones are transmitted on two or more of the base station antenna. The pilot tones are then detected and a feedback signal is generated based on the relationship between the pilot tones. (See col. 1, lines 45-62). While the Greenstein patent at col. 4, lines 53-59 indicates that a receiving terminal compares the strengths of successive received pilot tones and determines which of the channels, associated with the respective transmit antennae corresponding to the same

base station is currently carrying the stronger pilot tone, there is no discussion of energy accumulation or various other features recited in independent claims 1, 17, 33 and new claims 50 and 51. Accordingly, whether considered alone or in combination with the other applied references, the Greenstein patent does not anticipate or render obvious the pending claims.

With regard to the Dogan patent which the Examiner cites as disclosing "the use of Latin Squares base pilot tone hopping sequences." (Office Action page 4) Applicants respectfully submit that the portion of the reference cited by the Examiner does not mention pilot sequences. More importantly however, this reference does not teach, disclose, or suggest that adjacent base stations use pilot tone hopping sequences with different slopes as recited in various claims or various particular features of the hopping sequences recited in independent claims 1, 17, 33 and new claims 50 and 51 or any of the dependent claims which depend there from.

In view of the above remarks, it is respectfully submitted that independent claims 1, 17, 33 and new claims 50 and 51, as well as dependent claims 2-6, 19-22 and 34-38, and 49-52 are patentable over the applied references.

IV. Conclusion

In view of the above remarks, it is respectfully submitted that the pending claims are patentable over the applied references and are the application is now in condition for allowance.

Respectfully submitted,

November 24, 2004

Michael P. Straub
Michael P. Straub, Attorney
Reg. No. 36,941
Tel.: (732) 542-9070

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this paper (and any accompanying paper(s)) is being facsimile transmitted to the United States Patents and Trademark Office on the date shown below.

Michael P. Straub

Type or print name of person signing certification

Michael P. Straub

November 24, 2004